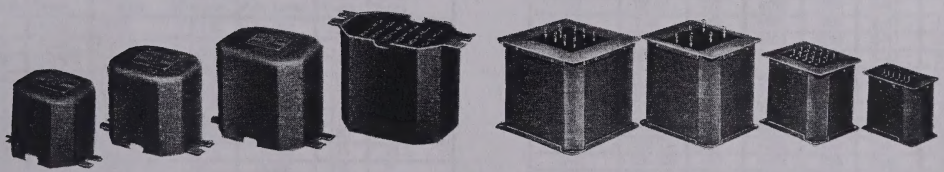
TERMINAL ARRANGEMENTS

TYPE S TRANSFORMERS



UNITED TRANSFORMER CORPORATION
150 VARICK STREET • NEW YORK 13, N. Y.
EXPORT DIVISION: 13 EAST 40th STREET, NEW YORK 16, N. Y. CABLES: "ARLAB"

TYPICAL MODULATOR COMBINATIONS

S-21, Driver, S-9
S-22, Driver, S-9

S-21 — 115 WATTS MAX.

P.P.-2A3 Driver S-9 Transf. Sec. Term.	P.P. Tubes	MODULATOR STAGE Watts Output	P.P. Load	Plate Volts	Plate Transf.	Bias Volts	Bias Trsf.
2-2	TZ-20	70	12000	800	S-46	0	
1-1	T-20	70	12000	800	S-46	40	S-51
*	845	75	4600	1000	S-47	175	S-52
3-3	4-46, 59	80	2500	470	S-44	0	
1-1	807	80	6600	600	S-45	30	S-51
1-1	800, RK-30	90	6600	750	S-45	40	S-51
1-1	800, RK-30	100	12000	1000	S-47	55	S-51
3-3	809	100	8400	750	S-45	5	S-51
2-2	825	100	6600	850	S-46	30	S-51
2-2	TZ-40	100	6000	750	S-45	0	
2-2	T-756	100	7000	850	S-46	30	S-51
1-1	50-T	100	8000	1000	S-47	90	S-51
2-2	RK-18	100	12000	1000	S-47	50	S-51
1-1	HK-354	100	15000	1000	S-47	60	S-51
*	845	105	8800	1250	S-47	225	S-52
3-3	RK-31	110	14000	1000	S-47	0	
1-1	4-6L6	110	2000	400	S-44	25	S-51
2-2	35-T	115	11000	1000	S-47	30	S-51

* Reverse S-9 transformer using terminals 1-1 for plates and P-P for grids.

S-18 — 12 WATTS MAX.

DRIVER TUBES: In the combinations shown below, typical suitable driver tubes are: 27, 30, 37, 49, 53, 56, 76, 79, 89, 6A6, 6C5, 6C6 triode, 6E6, 6N7.

DRIVER Transf.	DRIVER Sec. Term.	P.P. Tubes	MODULATOR STAGE Watts Output	P.P. Load	Plate Volts	Bias Volts
S-2	G-G	6E6	1.6	14,000	250	27
S-8	G-G	19, 1J6G	2.1	10,000	135	0
S-8	G-G	30	2.5	10,000	180	18
S-8	G-G	49	3.5	12,000	180	0
S-8	G'-G'	89	3.5	10,000	180	0
S-2	G-G	25L6	4	4,000	110	7.5
S-8	G'-G'	6Z7G	4.2	12,000	180	0
S-2	G-G	6Y6G	7	4,000	135	13.5
S-8	G-G	79, 6Y7G	8	14,000	250	0
S-8	G'-G'	6AC5G	8	10,000	250	0
S-8	G'-G'	53, 6A6, 6N6, 6N7	10	10,000	300	0
S-2	G-G	2A3, 6A3, 6A5G, 6B4G	10	5,000	325	750 ohms
S-2	G-G	6B5	10	10,000	300	0
S-8	G-G	45	10	5,000	275	770 ohms
		SINGLE TUBES				Pri. Load
S-1	F-G	43, 45, 59, 71A, 12A5, 25A6, 25A7				4000 ohms
		31, 46, 59, 6V6, 33				6000 ohms
		33, 42, 46, 47, 49, 89, 2A5, 6F6, 6B5				7000 ohms
		59, 89 pentode				8000 ohms
		10, 41, 42, 6G6, 6K6				10,000 ohms
		38, 12A7				14,000 ohms

BIAS TRANSFORMER CONNECTIONS
S-51, S-52

Using the Special Series bias transformers any desired value of DC within the transformer rating can be obtained within approximately 6%. In most cases this eliminates the necessity for a voltage divider and improves the bias supply regulation accordingly.

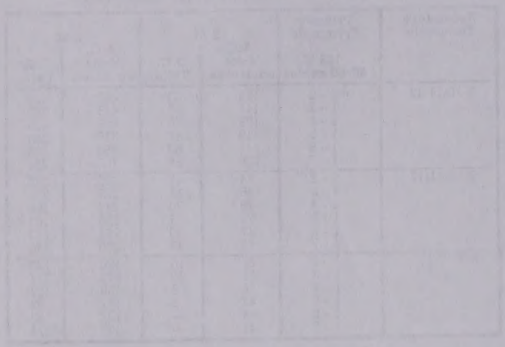
The DC voltages shown are based at 200 Ma.—single section filter—choke input—120 ohm choke. Lower values of DC will increase the output voltage somewhat.

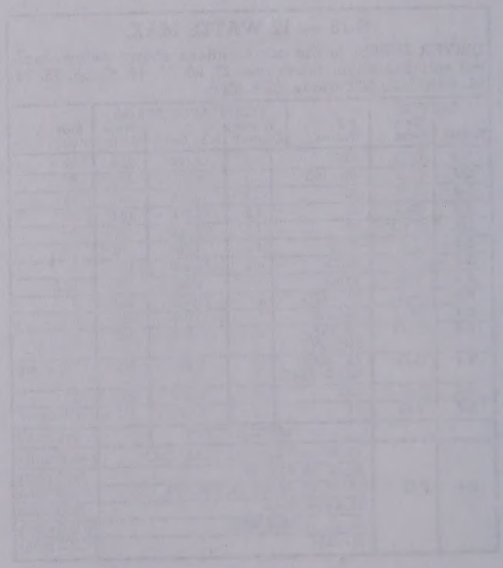
Secondary Terminals	Primary Terminals 115 V. 50/60 cycles	S-51 A.C. Volts each side	S-51 D.C. Volts	S-52 A.C. Volts each side	S-52 D.C. Volts
8-10-11-13	1 - 2	155	100	490	400
	1 - 3	141	87	445	360
	1 - 4	129	76	406	326
	1 - 5	119	67	376	298
	1 - 6	111	60	350	275
	1 - 7	106	55	326	254
9-10-11-12	1 - 2	94	45	300	230
	1 - 3	86	37	273	206
	1 - 4	78	30	249	184
	1 - 5	72	25	230	167
	1 - 6	67	20	214	152
	1 - 7	63	17	200	140
8-9-12-13	1 - 2	61	15	190	132
	1 - 3	55	10	173	117
	1 - 4	51	6	159	103
	1 - 5	47	3	147	92
	1 - 6	44	—	137	83
	1 - 7	41	—	127	74

S-22 — 250 WATTS MAX.

P.P.-2A3 Driver S-9 Transf. Sec. Term.	P.P. Tubes	MODULATOR STAGE Watts Output	P.P. Load	Plate Volts	Plate Transf.	Bias Volts	Bias Trsf.
3-3	RK-31	140	17000	1250	S-47	0	
*	50 T	135	12000	1250	S-47	112	S-52
*	50 T	250	20000	2000	S-50	180	S-52
*	50 T	160	17000	1500	S-49	140	S-52
2-2	TZ-40	175	6800	1000	S-47	0	
1-1	T-55	175	6900	1000	S-47	40	S-51
1-1	T-55	225	9400	1250	S-47	50	S-51
2-2	HF-100	200	7000	1000	S-47	35	S-51
2-2	HF-100	250	12000	1500	S-49	52	S-51
2-2	100 TH	200	5200	1000	S-47	0	
2-2	100 TH	250	7200	1250	S-47	0	
¶	100 TL	170	5200	1000	S-47	90	S-51
¶	100 TL	230	7200	1250	S-47	112	S-52
2-2	ZB-120	150	4800	750	S-45	0	
2-2	ZB-120	200	6900	1000	S-47	0	
2-2	ZB-120	245	9000	1250	S-47	0	
*	HK-154	200	7500	1000	S-47	155	S-52
*	HK-154	225	11400	1250	S-47	210	S-52
1-1	203 A	200	6900	1000	S-47	35	S-51
1-1	203 A	250	9000	1250	S-47	45	S-51
3-3	203 Z	200	6900	1000	S-47	0	
2-2	203 Z	250	6700	1100	S-47	0	
1-1	211	200	6900	1000	S-47	77	S-51
1-1	211	250	9000	1250	S-47	100	S-51
1-1	HK-354	220	15000	1500	S-49	100	S-51
2-2	808	190	12700	1250	S-47	15	S-51
2-2	830 B	175	7600	1000	S-47	35	S-51
2-2	838	200	6900	1000	S-47	0	
2-2	838	250	9000	1250	S-47	0	

* Reverse S-9, using 2-2 for plates and P-P for grids.
¶ Reverse S-9, using 1-1 for plates and P-P for grids.





CONNECTIONS OF UNIVERSAL MODULATION TRANSFORMERS

(S-18, S-19, S-20, S-21, S-22)

PRIMARY		SECONDARY											
P to P Imp.	P-B-B-P	Join 3 & 4 Con. to 1 & 6	Join 3 & 4 Con. to 2 & 6	Join 2 & 3 Con. to 1 & 6	Join 3 & 4 Con. to 2 & 5	Join 1 & 3 4 & 6 Con. to 1 & 4	Join 7 & 11 8 & 12 Con. to 7 & 8	Join 1 & 5 2 & 6 Con. to 1 & 2	Join 9 & 10 Con. to 7 & 12	Join 9 & 10 Con. to 8 & 12	Join 9 & 10 Con. to 8 & 11	Join 8 & 9 Con. to 7 & 12	Join 7 & 9 10 & 12 Con. to 7 & 10	Join 8 & 9 10 & 11 Con. to 8 & 10
Line to HF	500 ohms connected to 7 and 8; join 7 to 11 and 8 to 12	15000	9400	7800	5000	3800								
Line to HF	500 ohms connected to 1 and 2, join 1 to 5 and 2 to 6								16000	11000	8000	7000	4000	2000
2000	2-3-4-5						200		8500	6400	4300	3600	2150	1100
2000	1-2-5-6						350		16000	11500	8000	6500	4000	2000
3000	2 3 4 5						300		13000	9500	6500	5500	3200	16000
3000	1-2-5-6						500		23500	17000	12000	10000	6000	3000
3800	2-3-4-5						400		16400	12000	8200	7000	4000	2000
3800	1-2-5-6						650		30000	21500	15000	12500	7500	3750
4000	2-3-4-5						400		17500	12500	8600	7300	4300	2150
4000	8-9-10-11	5500	3500	3000	1850	1400		250						
5000	2-3-4-5						500		21500	16000	11000	9200	5400	2700
5000	8-9-10-11	7000	4300	3500	2300	1750		300						
6000	1-3-4-6						200		8500	6400	4300	3600	2100	1050
6000	8-9-10-11	8900	5200	4250	2750	2200		370						
6600	1-3-4-6						200		9500	7000	4750	4000	2400	1200
6600	8-9-10-11	9000	5600	4650	3000	2400		400						
7000	1-3-4-6						225		10000	7300	5000	4300	2500	1250
7000	8-9-10-11	9700	6000	5000	3200	2500		425						
8000	1-3-4-6						275		12000	8500	6000	5000	3000	1500
8000	8-9-10-11	11000	7000	5650	3700	2800		500						
9000	1-3-4-6						300		13000	9500	6500	5500	3200	1600
9000	8-9-10-11	12500	7750	6300	4200	3000		550						
9000	7-9-10-12	6000	4000	3200	2000	1500		275						
10000	1-3-4-6						325		14500	10500	7000	6000	3500	1750
10000	8-9-10-11	14000	8500	7000	4500	3500		600						
10000	7-9-10-12	7000	4300	3500	2300	1750		300						
12000	1-3-4-6						400		17500	12500	9000	7250	4300	2150
12000	7-9-10-12	8400	5200	4250	2750	2100		375						
14000	7-9-10-12	10000	6000	5000	3200	2450		425						
16000	7-9-10-12	11000	7000	5600	3700	2800		500						
18000	7-9-10-12	12500	7750	6300	4200	3150		550						
14000	13-3-4-14								12000	8000	5500	4700	3000	1500
16000	13-3-4-14								13000	9000	6500	5500	3200	1600
18000	13-3-4-14								15000	10500	7000	6000	3500	1750
20000	13-3-4-14								16500	11500	8000	7000	4000	2000
22000	13-3-4-14								18000	13000	9000	7500	4500	2250

S-22 ONLY

		Join 3 & 4 Con. to 13 & 14	Join 3 & 4 Con. to 1 & 14	Join 4 & 6 Con. to 13 & 14	Join 3 & 4 Con. to 13 & 5	Join 2 & 3 Con. to 13 & 14	Join 3 & 13 4 & 14 Con. to 4 & 13
14000	7-9-10-12	17600	13500	7000	9000	10800	4400
16000	7-9-10-12	20000	15500	8000	10300	12400	5050
18000	7-9-10-12	22400	17400	9000	11500	13900	5650

S-22 ONLY

S-19 — 30 WATTS MAX.

(53, 56, 6C6 triode, 6N7, may be substituted for 6C5 tubes)

DRIVER			MODULATOR STAGE				
Tube or Tubes	Transf.	Sec. Terms.	P.P. Tubes	Watts Outp't	P.P. Load	Plate Volts	Bias Volts
6C5	S-10	G-G	6V6	13	8,000	300	20
6C5	S-2	G-G	6B5	13.5	10,000	325	0
6C5	S-10	G-G	2A3, 6A3, 45, 6A5G, 6B4G	15	3,000	325	68
6C5	S-10	G-G	2A5, 42, 6F6, Pentode AB	10	10,000	375	340 ohms
2A5	S-8	G-G	2A5, 42, 6F6, triode AB	18	6,000	350	38
89	S-8	G'-G'	Parallel 53's, 6A6, 6N6, 6N7	19	5,000	300	0
45	S-8	G-G	10, 1602	25	8,000	425	50
45	S-8	G'-G'	46, 59	25	6,000	425	0
45	S-8	G'-G'	841	28	7,000	425	5
6C5	S-10	G-G	6L6 self bias	30	6,600	400	23

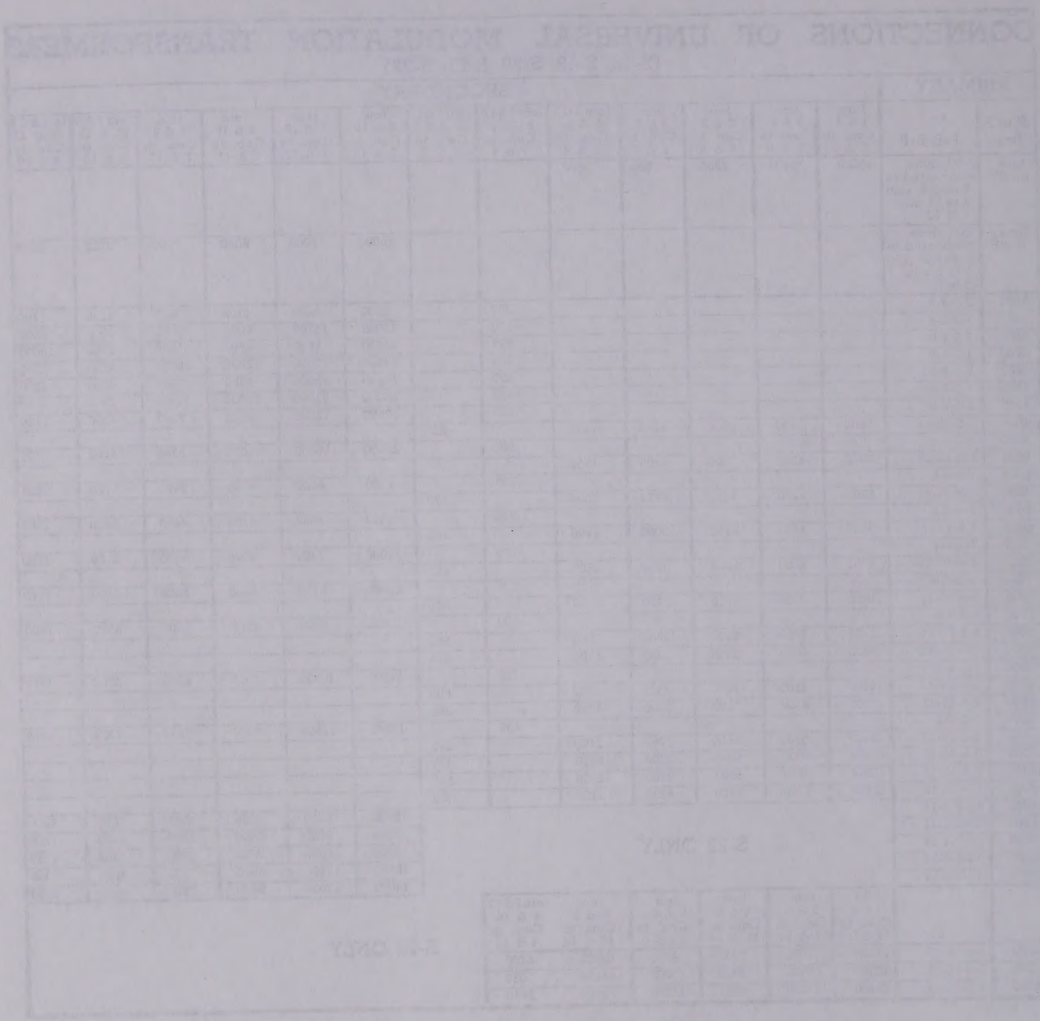
TYPICAL MODULATOR COMBINATIONS (Cont.)

S-20 — 55 WATTS MAX.

DRIVER			MODULATOR STAGE					
P.P. Tubes	Transf.	Sec. Term.	P.P. Tubes	Watts O'tp't	P.P. Load	Plate Volts	Plate Tr'sf.	Bias Volts	Bias Trsf.
Single 45	S-8	G'-G'	46	40*	5000	470	S-44	0	
2A3	S-9	1-1	801	45	10000	600	S-45	75	S-51
2A3	S-9	3-3	1608	50	5000	425	S-44	15	S-51
2A3	S-9	1-1	T-20	50	8000	600	S-45	30	S-51
Single 45	S-8	G'-G'	4-46, 59	56	3000	425	S-44	0	
6C5	S-10	G-G	6L6 AB2	60	3800	400	S-39	25	S-51
6C5	S-10	G-G	4-6L6	60	3300	400	S-40	23	
2A3	S-9	3-3	809	60	5000	500	S-41	0	

* Above manufacturers' rating, but frequently employed by amateurs.

Drivers—S-8, S-9, S-10



CONNECTION CHARTS · SPECIAL SERIES TRANSFORMERS · PRIMARY CONNECTIONS

S-5, S-6

Connect terminals marked 'M' to mike.

S-7

Connect P to plate; B to plate return; 'M' to mike.

S-8, S-9, S-10

See modulator charts, for tube types and connections.

S-12, S-13

For 500 ohms, connect to 1 and 2
For 2000 ohms, connect to 2 and 3
For 4000 ohms, connect to 1 and 3

OUTPUT TRANSFORMERS

S-14 Single tubes

Always connect to 1 for plate return.

Connect plate to 2 for 2500 ohms, for 2A3, 6A3, 6A5G, 6B4G, 6L6, 6Y6, 25L6, 35L6.

Connect plate to 3 for 4000 ohms, for 2A5, 6F6 triode, 12A5, 25A6, 43, 45, 50, 71A.

Connect plate to 4 for 7000 ohms, for 2A5, 6AC5, 6F6, 6K6, 6N6, 7B5, 20, 31, 33, 47.

Connect plate to 5 for 10,000 ohms, for 37, 38, 41, 1G5, 3C5, 6A4, 6N7.

S-15 P.P. Tubes

Always connect to 4 for plate return.

Connect to 3 and 5 for 4000 ohms, for 25L6, 6Y6G.

Connect to 2 and 6 for 5000 ohms, for 2A3, 6A3, 6A5G, 6B4G, 45.

Connect to 1 and 7 for 10,000 ohms, for 30, 49, 89, 1H4, 6Z7G, 6AC5G, 53, 6A6, 6N6, 6N7, 6B5.

S-16 P.P. Tubes

Always connect to 4 for plate return.

Connect to 3 and 5 for 3000 ohms, for 2A3, 6A3, 6A5G, 6B4G, AB.

Connect to 2 and 6 for 6000-6600 ohms, for 2A5, 6F6, 42 triodes AB, 46, 59, 6L6.

Connect to 1 and 7 for 10,000 ohms, for 6B5, 6V6, 2A5, 6F6, 42 pentodes AB.

S-17 P.P. Tubes

Always connect to 4 for plate return.

Connect to 3 and 5 for 3300 ohms, for four 6L6's, four 46's.

Connect to 2 and 6 for 3800 ohms, for two 6L6's, AB2.

Connect to 1 and 7 for 5000 ohms, for 1608, 809.

S-18, S-19, S-20, S-21, S-22

See modulator charts

SECONDARY CONNECTIONS

S-12, S-13, S-14, S-15, S-16, S-17

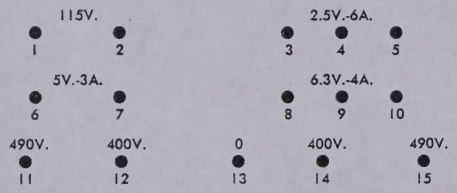
For 2 ohms, connect to 8 and 15. All other impedances as indicated.

S-73

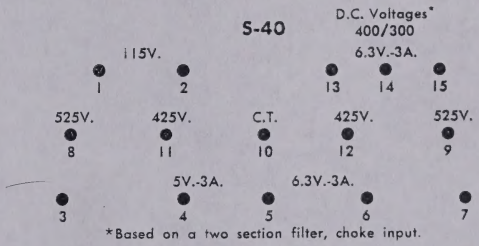
Sec.—for 800's, 801's, connect grids to 1-1; for 805's, 830B's, 6L6's, 46's, grids to 2-2; for 809's, 838's, 203A's, ZB120's, grids to 3-3; Grid-return always to 'F.'

SPECIAL SERIES PLATE AND FILAMENT TRANSFORMERS
TERMINAL BOARD LAYOUTS

S-39

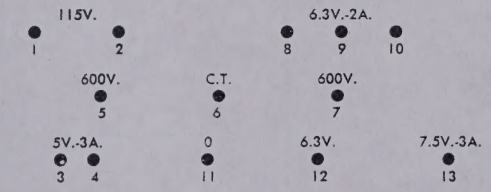


S-40

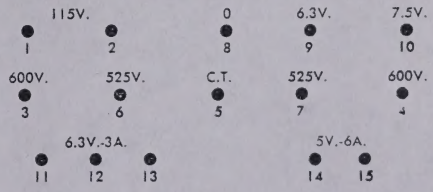


*Based on a two section filter, choke input.

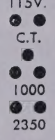
S-41



S-42



S-74



Notes for S-74

Maximum D.C. current when both windings are used, 150 MA. on each winding.

Maximum D.C. current on low voltage section 300 MA. (IF USED ALONE).
Maximum D.C. current on high voltage section 200 MA. (IF USED ALONE).

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